

detection means; and

a first analysis valve interface positioned between said storage channel and said first analysis region.

173. The cartridge of claim 172 wherein said storage channel is formed by a first sheet attached to a second sheet having a cutout region attached to a third sheet attached to the second sheet.

174. The cartridge of claim 172 wherein said storage channel is a spatially periodic channel.

175. The cartridge of claim 174 wherein said storage channel is an isotropic spatially periodic channel.

176. The cartridge of claim 174 wherein the width of said storage channel is between about 25 and 2,000 μm .

177. The cartridge of claim 176 wherein the depth of said storage channel is less than about 300 μm .

178. The cartridge of claim 172 also comprising a resuspension pump interface in fluidic connection with said storage channel.

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179. The cartridge of claim 178 wherein said resuspension pump interface is positioned between said sample inlet and said storage channel.
180. The cartridge of claim 178 wherein said resuspension pump interface is positioned along said storage channel.
181. The cartridge of claim 178 wherein said resuspension pump interface is a syringe pump interface.
182. The cartridge of claim 172 wherein said sample inlet comprises a septum.
183. The cartridge of claim 172 wherein said sample inlet comprises a valve interface.
184. The cartridge of claim 183 wherein said first analysis valve interface comprises a pinch valve interface.
185. The cartridge of claim 172 wherein said first analysis region comprises an electrical analysis region.
186. The cartridge of claim 185 wherein said electrical analysis region comprises an electrical interconnect.

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187. The cartridge of claim 172 wherein said first analysis region comprises an optical analysis region.
188. The cartridge of claim 187 wherein said optical analysis region comprises a window.
189. The cartridge of claim 187 further comprising a sheath flow assembly positioned along said first analysis channel between said storage channel and said first analysis region.
190. The cartridge of claim 189 wherein said sheath flow assembly comprises first and second sheath fluid channels on either side of and converging with said first analysis channel.
191. The cartridge of claim 190 wherein the width of said first analysis channel does not contract within said sheath flow assembly.
192. The cartridge of claim 190 wherein said sheath flow assembly further comprises upper and lower sheath fluid chambers positioned above and below and converging with said first analysis channel.
193. The cartridge of claim 192 wherein said sheath flow assembly provides hydrodynamic focusing in both the widthwise and depthwise directions.

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194. The cartridge of claim 190 wherein said first analysis channel contracts in the widthwise and/or depthwise direction after converging with said sheath flow channels.
195. The cartridge of claim 172 further comprising a reagent inlet in fluid communication with said first analysis channel between said storage channel and said first analysis region.
196. The cartridge of claim 195 wherein said reagent inlet comprises a syringe pump interface.
197. The cartridge of claim 195 further comprising a reagent storage reservoir in fluid communication with said reagent inlet.
198. The cartridge of claim 195 further comprising a mixing channel between said reagent inlet and said first analysis region.
199. The cartridge of claim 198 wherein said mixing channel is a spatially periodic channel.
200. The cartridge of claim 199 wherein said mixing channel is an isotropic spatially periodic channel.
201. The cartridge of claim 172 wherein said first analysis channel further comprises a second analysis region, in series with said first analysis region.

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202. The cartridge of claim 172 further comprising a second analysis channel, having a second sample analysis region, in parallel with said first analysis channel.
203. The cartridge of claim 202 wherein said first sample analysis region comprises a filling status gauge.
204. The cartridge of claim 172 further comprising a waste storage container fluidically connected with said first analysis channel.
205. The cartridge of claim 204 wherein said waste storage container comprises a waste storage channel.
206. The cartridge of claim 204 wherein said waste storage container is an expandable compartment.
207. The cartridge of claim 172 further comprising a vent in gaseous communication with said first analysis channel.
208. The cartridge of claim 207 wherein said vent is a gas-permeable plug, said plug having reduced permeability when in contact with a liquid.
209. The cartridge of claim 172 for use with a measurement apparatus, further including

alignment markings for positioning said cartridge within said measurement apparatus.

210. The cartridge of claim 172 wherein said cartridge is made of three or more laminated sheets.

211. The cartridge of claim 210 wherein said laminated sheets are made of plastic.

212. The cartridge of claim 210 wherein said sheets are bonded together by adhesive substantially covering the abutting surfaces thereof.

213. A fluidic cartridge for analyzing a particle-containing sample, comprising:

a sample inlet;

a sample storage container comprising a nonporous, convoluted sample storage channel in fluidic communication with said sample inlet, wherein the storage channel has a plurality of particle capture regions;

a first sample analysis region comprising access to detection means, said sample analysis region being in fluidic communication with said sample storage container;

a first sample analysis valve interface positioned between said storage container and said first analysis region; and

a resuspension means for resuspending particles sedimented in said sample storage container.

214. The cartridge of claim 213 wherein said sample storage container comprises a convoluted sample storage channel and wherein said resuspension means comprises a resuspension pump interface.

215. The cartridge of claim 214 wherein said resuspension pump interface is a syringe pump interface.

216. The cartridge of claim 213 wherein said sample storage container comprises a reservoir and wherein said resuspension means comprises an ultrasonic vibrator acoustically coupled to said reservoir.

217. The cartridge of claim 213 wherein said sample storage container comprises a reservoir and wherein said resuspension means comprises a mechanical agitator positioned within said reservoir.

218. The cartridge of claim 217 wherein said mechanical agitator comprises a stir bar.

219. The cartridge of claim 217 wherein said mechanical agitator comprises a piston.

220. The cartridge of claim 213 wherein said sample storage container comprises a reservoir, and wherein said resuspension means comprises a mechanical agitator positioned outside of said reservoir and vibrationally coupled with said reservoir.